

What is claimed is:

1. A production method of a laminated soft magnetic member in which a plurality of soft magnetic metal layers and insulating layers interposed between said plurality of soft magnetic metal layers are laminated together, the method comprising steps of:

sheet formation step for obtaining a soft magnetic sheet by directly or indirectly forming said soft magnetic metal layer on an insulating resin film constituting said insulating layer;

lamination step for obtaining said laminated soft magnetic member by laminating a plurality of said soft magnetic sheets; and

heat treatment step for subjecting said soft magnetic sheet obtained in said sheet formation step or said laminated soft magnetic member obtained in said lamination step to heat treatment under the conditions set depending on the magnetic properties required for said laminated soft magnetic member in the completed condition thereof.

2. A production method of the laminated soft magnetic member according to claim 1, wherein said heat treatment step is conducted prior to said lamination step.

3. A production method of the laminated soft magnetic member according to claim 1, wherein said heat treatment step is conducted subsequent to said lamination step.

4. A production method of the laminated soft magnetic member according to claim 1, wherein said heat treatment step is conducted concurrently with said lamination step.

5. A production method of the laminated soft magnetic member according to claim 4, wherein said heat treatment step is conducted concurrently with said lamination step so that a plurality of said soft magnetic sheets obtained in said sheet formation step are made to pass between rolls facing each other for lamination thereof, said rolls being maintained at a predetermined temperature by heating.

6. A production method of the laminated soft magnetic member according to claim 1, wherein a predetermined pressure is applied in said heat treatment step to said soft magnetic sheet obtained in said sheet formation step or said laminated soft magnetic member obtained in said lamination step.

7. A production method of a laminated soft magnetic member according to claim 1, wherein said heat treatment is conducted under the condition in which a predetermined tension is applied.

8. A production method of a laminated soft magnetic member in which a plurality of soft magnetic metal layers and insulating layers interposed between said plurality of the soft magnetic metal layers are laminated together, the method comprising steps of:

sheet formation step for obtaining a soft magnetic sheet by forming said soft magnetic metal layer on an insulating resin film constituting said insulating layer;

lamination step for obtaining said laminated soft magnetic member by laminating a plurality of said soft magnetic sheets; and

heat treatment step for subjecting said soft magnetic sheet obtained in said sheet formation step or said laminated soft magnetic member obtained in said lamination step to a heat treatment under the condition in which a predetermined tension is applied thereto.

9. A production method of the laminated soft magnetic member according to claim 8, wherein the relation of $0.01 \sigma \leq T < 0.1 \sigma$ is satisfied where T denotes said predetermined tension and σ denotes the tensile strength of said insulating resin film.

10. A production method of the laminated soft magnetic member according to claim 8, wherein said heat treatment is conducted so that either said soft magnetic sheet obtained in said sheet formation step or said laminated soft magnetic member obtained in said lamination step is made to contact a roll maintained at a predetermined temperature.

11. A production method of the laminated soft magnetic member according to claim 8, wherein said heat treatment applies

rolling to said soft magnetic sheet obtained in said sheet formation step or said laminated magnetic sheet obtained in said sheet formation step by use of a pair of rolls at least one of which is maintained at a predetermined temperature.

12. A production method of the laminated soft magnetic member according to claim 11, wherein said laminated soft magnetic member is obtained by applying said rolling to a plurality of said soft magnetic sheets in a superposed condition.

13. A production method of a soft magnetic sheet comprising a soft magnetic metal layer formed directly or indirectly on an insulating resin film, the method comprising steps of:

obtaining said soft magnetic sheet by forming said soft magnetic metal layer on said insulating resin film by means of the direct or indirect plating of said soft magnetic metal; and

adjusting the magnetic properties of said soft magnetic sheet under the conditions set depending on the magnetic properties required for a soft magnetic member which is constituted by said soft magnetic sheet, in the completed condition of said soft magnetic member.

14. A production method of the soft magnetic sheet according to claim 13, wherein the step for adjusting said magnetic properties is performed by heating said soft magnetic sheet.

15. A production method of the soft magnetic sheet according to claim 14, wherein said soft magnetic sheet is heated continuously over a period of time set depending on the magnetic properties required for the complete conditioned soft magnetic member, constituted by said soft magnetic sheet.

16. A production method of the soft magnetic sheet according to claim 14, wherein when said soft magnetic sheet is heated, a predetermined pressure is applied to said soft magnetic sheet.

17. A production method of the soft magnetic sheet according to claim 14, wherein when said soft magnetic sheet is heated, a predetermined tension is applied to said soft magnetic sheet.

18. A production method of the soft magnetic sheet according to claim 13, further comprising a step for laminating a plurality of said soft magnetic sheets.

19. A production method of the soft magnetic sheet according to claim 13, wherein in the step for obtaining said soft magnetic sheet, a metal sublayer is formed on said insulating resin film, and then said soft magnetic metal is plated on said metal sublayer.

20. A production method of the soft magnetic sheet according to claim 13, wherein said insulating resin film is made of polyethylene terephthalate or polybutylene terephthalate.

21. A production method of a soft magnetic sheet comprising a soft magnetic metal layer formed directly or indirectly on an insulating resin film, the method comprising steps of:

obtaining said soft magnetic sheet by forming said soft magnetic metal layer on said insulating resin film by directly or indirectly plating the soft magnetic metal thereon; and

applying heat treatment to said soft magnetic sheet under the condition in which a predetermined tension is applied thereto.

22. A production method of the soft magnetic sheet according to claim 21, wherein said heat treatment is conducted so that said soft magnetic sheet is made to pass between a pair of rolls at least one of which is maintained at a predetermined temperature.

23. A production method of the soft magnetic sheet according to claim 21, wherein in the step for obtaining said soft magnetic sheet, a metal sublayer is formed on said insulating resin film, and then said soft magnetic metal is plated on said metal sublayer.

24. A method for heat treating a laminated soft magnetic member in which a plurality of soft magnetic metal layers and insulating layers interposed between said plurality of the soft magnetic metal layers are laminated together, wherein said laminated soft magnetic member is heat treated so as to provide the properties required for said laminated soft magnetic member in the completed condition thereof.

25. A method for heat treating the laminated soft magnetic member according to claim 24, wherein said heat treatment is conducted in order to adjust the magnetic properties of said laminated soft magnetic member.

26. A method for heat treating the laminated soft magnetic member according to claim 24, wherein said heat treatment is conducted in order to adjust the warping of said laminated soft magnetic member.